REQUEST TO CORRECT INVENTOR'S NAME DURING PENDENCY ACCORDING TO EXAMINER'S NOTE UNDER MPEP §605.04

The Applicant, Kenneth C. Humphries, respectfully requests that his name be properly recorded as through no deceptive intent the intial Application Data Sheet erroneously listed his name as Charles K. Humphries. The Oath and Declaration signed by Kenneth C. Humphries is correct. The Applicant, hereby submits a new Application Data Sheet with additional changes to Applicant Charles Plant's street address and phone number associated with the Correspondence Address.

RESPONSE TO OFFICE ACTION OF JUNE 9, 2008

This amendment document is prepared in response to an Office Action dated June 9, 2008. In the current non-final Office Action the Examiner states that claims 1-11 and 13-16 are pending in the application of which claims 1-8, 10 and 13-16 are rejected and claims 9 and 11 are objected to. In the present present claim set contains claims two independent claims, namely Claim 1 and Claim 15 all other current claims are dependent claims. Thus, please find enclosed in this amendment document the following:

- Argument against Rejection of Claims under 35 USC §102(b)
- Argument against Rejection of Claims 8 and 14 under 35 USC §103(a)
- Amendment to the Claims

ARGUMENT AGAINST REJECTION OF CLAIMS UNDER 35 USC §102(b)

Claims 1-4, 12 and 15 as anticipated by Cornsweet, et al (US Patent No. 5,410,376)

The Examiner rejected Claims 1-4, 12 and 15 by reiterating the rejections of the first Office Action of May 24, 2007. The Applicant, however, has cancelled Claim 12 and thus will only address Claims 1-4 and 15 in this section. According to the the first Office Action Cornsweet teaches in Fig. 1 a saccadic-motion detection device comprising an optical system (16, 20, 21, 24, 22) for focusing light reflected or emitted from a subject's eye (10) onto an optical navigation chip (23, 25). The Applicant, again, respectfully disagrees that an optical navigation chip taught by the present invention is expressly or inherently the same as the CCD (25) or quadrant detector (23) taught in Cornsweet. The Applicant reiterates that Cornsweet teaches that the light reflected or emitted from a subject's eye (10) is sent through a beam splitter(22) then separately to a CCD video camera(25) and a quadrant detector(23). Neither the CCD video camera nor the quadrant detector are similar in form, method, or function to the optical navigation chip of claim 1 in the present invention.

With regard to the Examiner's contention in the present office action that the CCD (25) portion of Cornsweet is used for tracking eye movement, it is first necessary to clarify the phrase "tracking eye movement" so as to clearly distinguish between smooth pursuit eye movement and saccadic eye movement. Smooth pursuit eye movement refers to a relatively slow, smooth motion of the eyes by which an observer's gaze is fixed to a moving object. Saccadic eye movement refers to very fast eye movements by which an observer's gaze shifts rapidly between successive fixation points in a visual scene. These two fundamentally different forms of eye movement are controlled by two different neuronal mechanisms. The present invention measures saccadic eye motion by means of an optical navigation chip which specifically and necessarily affords the high frame rates above 1200 frames per second which are capable of tracking the high speed saccadic

movement of the eye. The applicant strongly disagrees with the Examiner's contention that the CCD video camera of Cornsweet is used for such tracking of eye movement. The Examiner cites the abstract, column 1 lines 6-10 and column 2 lines 3-5 in support of said contention. The text of Cornsweet cited by the Examiner does indeed state that an object of the Cornsweet invention is to track eye movement. Nowhere, however, in the cited passages is it mentioned that the CCD is what is used to track eye movement. In fact, Cornsweet, in column 1, lines 31-54 specifies the special high speed properties of saccadic eye movements and specifically states that saccadic eye movements are faster than video based instruments can detect. In column 1. lines 54-59 Cornsweet goes on to state that "saccades are so quick … they cannot be measured accurately unless the position of the eye is sampled at a high rate. Ordinary video rates … do not give accurate readings of onset time, velocity, amplitude, shape, etc." Furthermore, Cornsweet, in column 3, lines 34-42 explicitly states that "[t]he tracking system according to the invention is independent of the camera and pupil diameter measuring systems ..."and in column 3, lines 62-63, Cornsweet states that "[t]he tracking system according to the invention uses a four quadrant detector 23, instead of the camera 25".

The entire eye tracking system electromechanical tracking servo loop includes stepper motors, a tracking mirror, an analog error signal generating system, the quadrant detector, etc. See Cornsweet column 5, lines 51-66. The quadrant detector is assembled of four infrared detectors on which an image of the pupil is centered. The pupil is centered by an electromechanical feedback servo loop. The quadrant detector produces analog horizontal and vertical error signals for the purpose of driving servomotors. On the other hand, the optical navigation chip described in the specification of the present invention inherently contains a CCD array of from 256 to 400 elements on which an image of the surface of the eye freely moves. The optical navigation chip generates x and y motion data as a native function. Nevertheless, the Applicant hereby amends Claim 1 to further distinguish the optical navigation chip.

According to MPEP §2131 a " 'claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.' *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)." More importantly in MPEP § 2131.02 '[T]the identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Thus, given the above arguments, and amended Claim 1, it is clear that Cornsweet does not anticipate each and every element as set forth in the Claim 1 of the present invention and thus the 102(b) rejection has been overcome. Accordingly, the dependent claims are allowable for the same reason although Claim 2 has been amended to further distinguish the present invention from Cornsweet.

Regarding the Claim 2 rejection, Cornsweet in Column 4 line 5 refers to digitization of the error signals which represent the complex interaction of the eye motion, the stepper motor motion and the tracking mirror motion. Claim 2 of the present invention, especially as it is now amended, specifies that the generation of representations of movement or position is accomplished directly by the optical navigation chip.

Claim 15 has been amended to indicate that the present invention does not require the complex electromechanical system as described in Cornsweet.

Claims 1-7, 10, 12, 15 and 16 as anticipated by Rothberg, et al (US Patent No. 5,422,690)

The Examiner rejected Claims 1-7, 12, 15 and 16 by reiterating the rejections of the first Office Action of May 24, 2007. The Applicant, however, has cancelled Claim 12 and thus will only address Claims 1-7 and 15-16 in this section. Per the first Office Action the Examiner rejected Claims 1-7, 10, 12, 15 and 16 as anticipated by Rothberg, et al (US Patent No. 5,422,690)("Rothberg"). Regarding the Claim 1 rejection, as the Examiner noted, Figure 6 in Rothberg is the same as Figure 1 in Cornsweet with the exception of the

numerals being different. Thus, the amendments and arguments to Claim 1 made for Cornsweet apply equally to the rejection based on Claim 1 under Rothberg.

Thus, given the above arguments it is clear that Rothberg does not anticipate each and every element as set forth in the Claim 1 of the present invention and thus the 102(b) rejection has been overcome. Accordingly, the dependent claims are allowable for the same reason.

Claim 15 has been amended to indicate that the present invention does not require the complex electromechanical system as described in Rothberg.

Regarding the Claim 16 rejection, Claim 16 as amended in the present invention, clearly states that the saccadic-motion detection device is a handheld device. Rothberg in Column 2, lines 62-65 teaches a device that remains as large as a catalog case and requires it to be "set up on a table top".

Claims 1 and 13 as anticipated by Smith, Robert F. (US Patent No. 6,666,857)

The Examiner rejected Claims 1 and 13 by reiterating the rejections of the first Office Action of May 24, 2007. Per the first Office Action the Examiner rejected Claims 1 and 13 as anticipated by Smith, Robert F. (US Patent No. 6,666,857)("Smith"). The amended Claim 1 clearly distinguishes the present invention from Smith. Nonetheless, the Applicant reiterates the rationale against this §102(b) rejection which was presented in the response to the Office Action of May 24, 2007.

Smith presents a system which precisely controls the application of a pulsed excimer laser to perform transepithelial ablation of the cornea in photorefractive keratectomy (PRK) procedures. See column 3 lines 37 – 51. The precision is accomplished through the use of two detection and control subsystems. One subsystem performs wavefront analysis to produce a target corneal topography which is then compared against the continuously

monitored corneal topography changes during ablation. The second subsystem performs eye tracking which adjusts the ablative laser beam to compensate for eye movement during the procedure. See column 2 lines 63-67. Only the elements of the eye tracking subsystem are relevant to the the present invention.

With regard to Smith's Fig. 1, only items 20, 201, 9, 13, and 18 are involved in the detection of eye motion. All other elements, including 14, 17, 16, and 19, perform functions of other subsystems not directly related to detection of eye motion. The eye tracking system requires the application of an annular mask (20) which is attached to the sclera of the eye by means of small projections (201). See column 7 lines 43 – 54, column 12 lines 34 – 49, and Fig. 4a The mask contains reference markings which are necessary for the operation of the segmented charge coupled device, SCCD (18). See column 5 lines 45-52. SCCD (18) is constructed by a series of linear charge coupled devices (LCCDs). See column 12 lines 49 – 55. An image of the mask reference markings is imaged onto the SCCD such that the reference markings are aligned onto the corresponding LCCDs. Eye position is detected by detecting the intensity maxima induced onto the LCCDs by the image of the reference marks.

The SCCD bears no similarity to the optical navigation chip of claim 1 of the present invention. The SCCD is assembled of six linear CCD's each about 1000 to 2000 pixels long and 1 pixel wide. Conversely, the optical navigation chip of the present invention inherently contains a CCD array of from 256 to 400 elements on which an image of the surface of the eye freely moves. The SCCD produces intensity maxima signals which must be further processed to determine eye motion. Conversely, the optical navigation chip of the present invention generates x and y motion data as a native function. The SCCD requires that an annular mask be mounted to the sclera of the eye by means of small projections into the epithelial layer of the eye. Conversely, the optical navigation chip of the present invention does not require that any object come into contact with the eye.

Thus, given the above arguments it is clear that Smith does not anticipate each and every element as set forth in the Claim 1 of the present invention and thus the 102(b) rejection has been overcome. Accordingly, the dependent Claim 13 allowable for the same reason.

Claims 1- 4, 12, 13 and 15 as anticipated by Yee et al (US Patent No. 6,322,216)

he Examiner rejected Claims 1-4, 12, 13 and 15 by reiterating the rejections of the first Office Action of May 24, 2007. The Applicant, however, has cancelled Claim 12 and thus will only address Claims 1-4 and 13 and 15 in this section. Per the first Office Action the Examiner rejected Claims 1-4 and 13 and 15 as anticipated by Yee et al (US Patent No. 6,322,216)("Yee"). The amendments made to Claim 1 and Claim 15 clearly distinguishes the present invention over Yee. Additionally, Yee describes two embodiments which are distinguished by the speed of the cameras used as elements 13h and 13v (See Yee column 3 lines 47 – 58 and column 5 lines 61 – 64). In those embodiments using ordinary cameras, Yee admits in column 3 lines 47 – 50 that the speed is insufficient to follow saccadic movements. Thus, Yee directly teaches against the present invention and by definition can not anticipate it. See MPEP 2141.02 and 2145.X. Accordingly, the dependent Claims 2- 13 are allowable for the same reason.

ARGUMENT AGAINST REJECTION OF CLAIM 8 AND 14 UNDER 35 USC §103(a)

Claims 8 and 14 as made obvious by Cornsweet, et al (US Patent No. 5,410,376) and by Rothberg, et al (US Patent No. 5,422,690)

The Examiner rejected Claims 8 and 14 as made obvious by Cornsweet, et al (US Patent No. 5,410,376)("Cornsweet") and by Rothberg, et al (US Patent No. 5,422,690). Both Cornsweet and Rothberg detect eye motion using a somewhat complex electromechanical tracking servo loop This tracking servo loop bears no similarity to the optical navigation chip and especially as Claim 1 is now amended.